Welcome to NCMC-5

Processing and Characterization

NIST Combinatorial Methods Center

April 26-27, NIST Gaithersburg, MD

Welcome to NCMC-5

- NIST Combinatorial Methods Center Update
- NCMC-5 Workshop Goals
- Agenda Overview

NCMC Member Partners

Now 24 institutions

Procter&Gamble
Rhodia
National Starch & Chemical
A member of the ICI Group
ICI
BASF
EASTMAN
3M
intel.
Bayer
BAYER
AIR PRODUCTS
DOW
ATOFINA
ExxonMobil
Symyx®
accelrys
PPG
AKZO NOBEL
MICHELIN
World Leader in Nanomechanical Test Instruments
Hysitron Incorporated
Sealed Air
Honeywell
di
Veeco
bp

Newest Member:

Newest Research Team Members

Polymer Formulations

T. Wu

Z. Cygan

C. Xu

Adhesion & Mechanical Properties

S-H. Moon

Arriving This Summer:
T. H. Epps
S. Guo

SPM/ Nanotech

D. Julthongpiput

Prof. D. Sohn
Hanyang U. Korea

Goals of NCMC-5

- Introduce Combi Relevant Technologies
  - Deposition and Processing
- Review NIST-wide Combi Efforts
  - Martin Green, *Ceramics Division*, Organizer
  - Inorganic Materials Resources
- Update of Polymers Research
  - Including new Focus Projects
- Discussion and Help Session
  - Gradient Fabrication Forum

NCMC-5 Technical Program

NIST Combinatorial Methods Center

NCMC-5: Combinatorial Processing & Characterization

April 26-27, 2004 ◊ Bldg. 101 / Employee Lounge

Monday, April 26th, 2004

8:15 am Registration
Coffee & Doughnuts

8:45 am Welcome and Introductions
Michael Fasolka, *Leader, Combi Group, MSEL NIST*

9:00 am Precision Dispensing - Lines, Dots, Layers and Blends
Jim Story, *nScrypt L.L.C.*

9:45 am Laser Fabrication of Combinatorial Libraries for Polymer and Biotechnology Development
Doug Chrisey, *Naval Research Lab*

10:30 am Coffee Break

10:45 am Characterization of Extrusion and Gradient Coating Processing
Jeff Gilman, *BFRL NIST*

11:15 am Multi-Functional Monitoring of Polymer/Clay Compounding Using Dielectric, Optical and Fluorescence Measurements
Anthony Bur, *MSEL NIST*

12:00 pm Lunch (NIST cafeteria, Bldg. 101)

1:30 pm Development of Combinatorial Screening Tools for Inorganic Materials
Ji-Cheng Zhao, *GE Global Research*

2:15 pm Mapping Surface Chemistry and Molecular Orientation with Combinatorial Near-Edge X-Ray Absorption Fine Structure
Daniel Fischer, *MSEL NIST*

2:45 pm Temperature-Dependent Studies of Gas Sensing Materials Using MEMS Microarrays
Steve Semancik, *CSTL NIST*

3:05 pm Combinatorial optimization of Ohmic contacts to GaN semiconductor
Albert Davydov, *MSEL NIST*

3:25 pm Coffee Break

3:40 pm Characterization of the Optical Properties of Compositionally Graded Thin Films
Peter Schenck, *MSEL NIST*

4:00 pm Structural Investigation of Functional Oxides Using Compositional Spreads
Leonid Bendersky, *MSEL NIST*

4:20 pm X-Ray Diffraction (XRD) and Electron Backscatter Diffraction (EBSD) Combinatorial Measurements
Mark Vaudin, *MSEL NIST*

4:40 pm Near-Field Optics for Materials Characterization on the Nanoscale
Steven Buntin, *CSTL NIST*

5:00 pm Inorganic Combinatorial Materials Science Programs in Japan
Martin Green, *MSEL NIST*

6:00 pm Reception (Summit Station)
(227 East Diamond Ave., Gaithersburg

6:30 pm Dinner (Summit Station)
(227 East Diamond Ave., Gaithersburg)

Over for Day 2 →

Novel Deposition Techniques

Invited Symposium

- **Jim Story, CEO, *nScrypt LLC***
- **Dr. Doug Chrisey, *Naval Research Laboratory***

Polymer Processing

NIST Symposium

- **Gradient Coating Processing**
  Jeff Gilman, BFRL NIST
- **Multifunctional Process Monitoring**
  Anthony Bur, MSEL NIST

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NIST Combinatorial Methods Center

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3:05 pm	Combinatorial optimization of Ohmic contacts to GaN semiconductor **Albert Davydov,** *MSEL NIST*
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5:00 pm	Inorganic Combinatorial Materials Science Programs in Japan **Martin Green,** *MSEL NIST*
6:00 pm	*Reception* (Summit Station) (227 East Diamond Ave., Gaithersburg
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Over for Day 2 →

Inorganic Materials Symposium

Martin Green, Ceramics Division

Invited Speaker

Ji-Cheng Zhao, *GE Global Research*

NIST Speakers

Daniel Fischer, *MSEL*

Steve Semancik, *CSTL*

Albert Davydov, *MSEL*

Peter Schenck, *MSEL*

Leonid Bendersky, *MSEL*

Mark Vaudin, *MSEL*

Steven Buntin, CSTL

Martin Green, *MSEL*

NCMC-5 Technical Program

Tuesday, April 27th, 2004

8:30 am *Coffee & Doughnuts*

9:00 am Introductions
Mike Fasolka, *MSEL NIST*

9:10 am Small angle Light Scattering for High Throughput Screening of Polymer Formulations
Alexander Norman, *MSEL NIST*

9:35 am A Multi-Sample Rheometer for High Throughput Measurements at Practical Frequencies and Strains
Howard Jeremy Walls, *MSEL NIST*

10:00 am New High-throughput Synthesis Methods using Microfluidic and Rapid Prototyping Techniques
Tao Wu, *MSEL NIST*

10:25 am Coffee Break

10:45 am Energy Analysis of Multi-Lens Adhesion Measurements
Aaron Forster, *MSEL NIST*

11:10 am MCAT-II: Recent Developments and Applications to Pressure Sensitive Adhesives
Seung-ho Moon, *MSEL NIST*

11:35 am Gradient Micropatterns: A screening tool for nanomeasurements and nanomaterials
Duangrut "Mai" Julthongpiput , *MSEL NIST*

12:00 pm Lunch (NIST cafeteria, Bldg. 101)

1:15 pm New Focused Project Feedback Session (Bldg. 224, Rms. B245 and A312)
- Formulations
- Adhesion
- Grafting SPM
- MALDI

2:15 pm Gradient Technology Brainstorming session
Audience will address questions and needs on properties they would like to make gradients

3:15pm New Member Tour (optional)

4:15 pm IFT Focus Project meeting (membership required)

For More information on the NCMC please go to www.nist.gov/combi

NCMC Project Updates

Polymer Formulations

HT Small Angle Light Scattering
Alexander Norman

Combi Rheometer
Jeremy Walls

Fluidics Mediated Synthesis
Tao Wu

Adhesion and Mechanics

Multi-lens Adhesion
Aaron Forster

High-throughput adhesion
Seung-ho Moon

SPM/NanoTech

Gradient MicroPatterns
D. Julthongpiput

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Breakout Discussion Sessions

NCMC Focus Projects
Two Concurrent Sessions
A) Formulations & Gradient Surface Tools
B) Adhesion Performance & MALDI Mass Spec.

Gradient Technology Q&A
A Panel Discussion and Brainstorming Session

New Members Tour

Please Remember to:

- Pick up lunch tickets from Cher Davis
- Sign up for Focus Project discussion sessions, either:
  - A) Formulations and Surface Tools
  - B) Adhesion and MALDI MS

THANKS!